breakout ABSTRACT

VISION to REALITY 2005

TITLE

Incorporating Environmental Public Health Indicators into Cumulative Risk Scores to Track the Disparate Burden of Pesticide Exposure in Wisconsin

THEME

Build a Sustainable National EPHT Network

KEYWORDS

pesticides, environmental public health indicators, tracking

BACKGROUND

Understanding the health consequences of pesticide exposure is a priority environmental health concern in Wisconsin and a primary goal of the state's environmental health tracking program. Understanding population exposures and subsequent health effects involves the assessment of a broad range of indicator measures. Current gaps in available measures for indicator development and exposure assessment, including a lack of information about occupational illness and injury, necessitate the development of unique methods to capture the burden of pesticide exposure and its potential risks to public health in the state.

OBJECTIVE(S)

The goal of this project is to develop and apply a combination of quantitative and qualitative methods to develop cumulative risk scores that can capture the geographic variability in exposure and potential health consequences associated with pesticides in Wisconsin. The project also aims to identify sensitive sub-populations at greatest risk of adverse effects from exposure. The development of a systematic method to derive a composite risk score that incorporates population exposure potential, toxicology, and population distribution will be used to increase our understanding of pesticide risks to population health, and enhance future state tracking efforts.

METHOD(S)

A three-stage approach is being utilized to create cumulative exposure risk scores for pesticides in Wisconsin: 1) Evaluate and rank the adverse health effects associated with pesticide exposure; 2) Assess the potential for exposure; and 3) Characterize the population at risk of exposure. Step one involves the development of a risk score to prioritize and select key health endpoints and their association with agricultural chemicals. Step two involves creating "exposure profiles" for each county by combining information from land use surveys/maps and well-water/public water supply data to estimate the extent of agricultural chemical concentrations in each of 72 counties. These data are combined with population density information to obtain cumulative risk scores and characterize the population exposure potential. Regional areas and sub-populations at greatest risk of exposure to agricultural chemicals are investigated by county and population subgroup maps. Non-agricultural pesticide exposures are captured from health datasets (poison control center, emergency department visit, hospital discharge, and mortality) and a chemical applicator database.

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RESULT(S)

The presentation will focus on the process used to track pesticide exposures in Wisconsin. Specific topics include:

- identification of relevant Environmental Public Health Indicators to use in tracking pesticide exposure and what to do when the ideal data are not available
- using a cumulative risk approach to facilitate exposure comparisons by region and population subgroups
- using this approach to assess exposure trends and compare results across states
- developing a similar approach for other environmental exposures

DISCUSSION/RECOMMENDATION(S)

A cumulative risk approach to assess potential population exposure and identify key health effects of concern provides a comprehensive picture of pesticide use and exposure in the state. This information can be used to guide surveillance, research, and intervention efforts, while simultaneously allowing for the ability to communicate findings to the public. Key concepts and lessons learned from the development process provide the template for comparing similar measures across states.

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